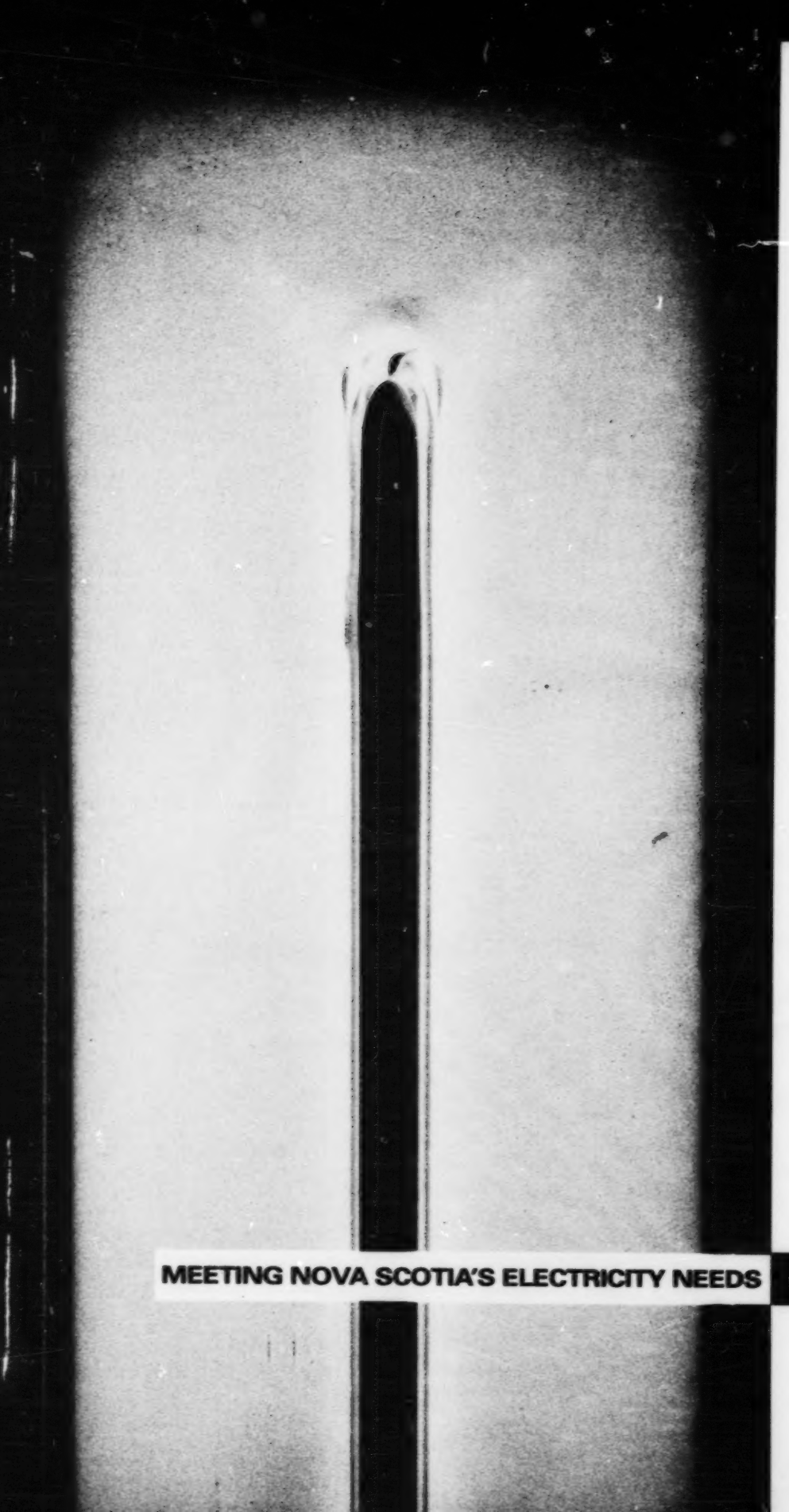
NOVA SCOTIA POWER CORPORATION



MEETING NOVA SCOTIA'S ELECTRICITY NEEDS

OPTIONS & OPPORTUNITIES

NOVA SCOTIA POWER'S MANDATE

1. To satisfy the needs of Nova Scotia for reliable, economic electrical service in a safe, effective and environmentally responsible manner while fostering the wise and efficient use of energy,

and, as a crown corporation,

2. to serve the broad social and economic interests of Nova Scotia.

NOVA SCOTIA POWER'S VALUES

OUR EMPLOYEES

- We work together safely with mutual trust and respect.
- We make effective use of modern technology and innovation to produce quality results.
- We recognize employee contributions through timely feedback, and fair and equitable rewards, opportunities and compensation.

OUR CUSTOMERS

- Service is our priority.
- Our goal is customer satisfaction.
- We provide our customers with quality, responsive and reliable service in an efficient, courteous and cost effective manner.

OUR ENVIRONMENT

- We respect and recognize our responsibility for the quality of the environment we share.
- We will continue to develop cost effective ways to fulfill this responsibility.
- We will continue to broaden our understanding of the environment and be considerate of potential impacts resulting from our activities.

OUR PROVINCE

- We are proud to belong to the Nova Scotian community, and to be a major contributor to its economic and technological development.
- We strive to be a leader in the energy sector in providing a resource vital to the people of Nova Scotia.
- As a good corporate citizen we conduct ourselves in a manner that is responsive to and respectful of community needs.

NOVA SCOTIA POWER CORPORATION

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MEETING NOVA SCOTIA'S ELECTRICITY NEEDS

OPTIONS & OPPORTUNITIES

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SHARING THE PLANNING

Our ultimate goal

This document's purpose is to explain the choices now facing Nova Scotia Power in meeting Nova Scotians' future electrical energy needs. We want to present to you, our customers, the general planning directions now being considered. Our ultimate goal is always to continue to meet your needs in the best possible way — doing the best thing for everyone. Our immediate goal is to gain your understanding and receive your comments and suggestions to help us plan for the future.

We're listening

Naturally, we are expecting criticism as well as commendation, but we want Nova Scotians to know that we are listening and responding to their concerns. As a crown corporation, Nova Scotia Power is responsible to the people of Nova Scotia. This document is the latest in an ongoing series of efforts — including customer surveys and focus groups — by which we hope to bring the public's concerns front and centre into Nova Scotia Power's planning process.

MEETING NOVA SCOTIA'S ELECTRICITY NEEDS THE NEXT 20 YEARS

Looking two decades ahead

In this document we will be talking about developing a direction for meeting Nova Scotia's electricity needs for the next twenty years. If that seems a long time into the future to be planning and making forecasts, we agree. And we acknowledge that there are uncertainties in such long term planning. So why do we have to plan this far ahead? One reason is that each new energy resource requires several years for design, approval and implementation. But the main reason is that we must evaluate many alternatives through time to determine which plans best meet our corporate objectives of providing reliable electricity when you need it, at a cost you can afford, and in an environmentally responsible way.

Complex issues, tough decisions

In planning to meet Nova Scotians' need for electricity, Nova Scotia Power faces some complex questions — on cost, reliability, and the environment; and some tough decisions — about resources, technologies, and management strategies. All of them stem from our root purpose: serving you.

Our purpose: serving Nova Scotians

Nova Scotia Power is not in the business of promoting the growth of electrical energy. In other words, Nova Scotia Power does not create or stimulate electrical demand within the province. We exist to satisfy the needs of Nova Scotians for electric service — and to do so in the most cost-effective way possible. All of our planning serves this end.

ANTICIPATING YOUR NEEDS

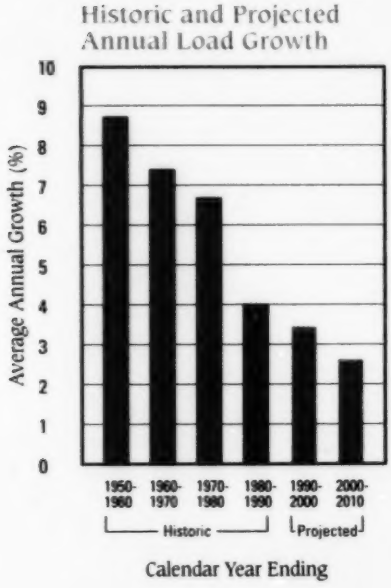
Because like all utilities we need to anticipate and provide for our customers' needs, the first step in our planning is to predict future demand levels. We do this in a process called load forecasting. A good load forecast is vital in planning the financial requirements, resource management strategies, environmental protection and overall efficient operation of the utility.

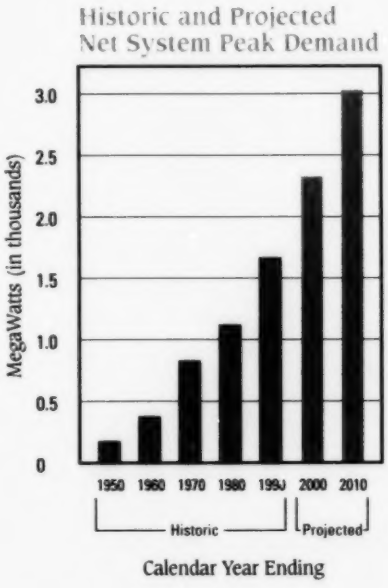
How is electricity demand growing?

The demand for electricity has grown dramatically over the past fifty years. In 1940 there were no televisions, VCRs or microwave ovens, and Nova Scotians were already consuming a fair amount of electricity. But by 1965 the demand was five times the 1940 level, and by 1989 it was some twenty times the 1940 level.

A declining growth rate...

Today, the need for electricity continues to grow, but in each of the last few decades the average annual rate of growth has been declining.





...but a continuing need

The 1990 Nova Scotia Power load forecast projects that electrical demand in this province — if unchecked — will continue to grow from some 1700 MW in 1990 to approximately 2400 MW in 2000, and 3100 MW in 2010. In other words, in the next two decades, Nova Scotians' demand for electricity will nearly double. As we will see, however, we do have at least one option to lower this projected growth: increase energy efficiency. If Nova Scotia Power can encourage and assist Nova Scotians in reducing the demand for electricity through energy efficiency, then we can change our current forecast and delay the construction of new plants. We call this approach **Power Smart**.

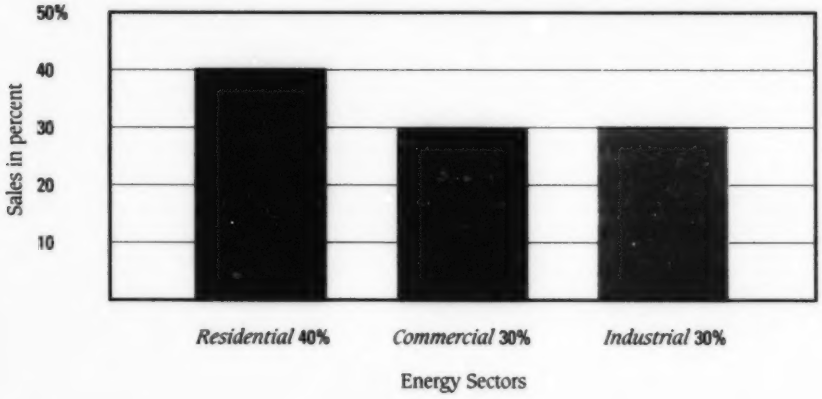
There are many new energy efficient products available in the marketplace that, if used by consumers, can dramatically reduce their demand for electricity without affecting their manner or standard of living. We will be discussing these later under the heading Energy Efficiency: Using Less Energy Better. The bottom line is that consumers can save themselves money and lessen environmental impacts of power generation by using energy more efficiently.

Efficiency cuts costs and benefits the environment

Nova Scotians, like all Canadians, use electricity in producing almost all goods and services, and in performing many daily tasks in the home. Therefore, although new technology and a new awareness of our resources will continue to make us more efficient in our energy use, our total usage is still forecast to increase as our population and economic activity increase.

Why so much growth?

1991 Energy Sector Sales



Who uses electrical energy?

Residential use of electricity has increased as a greater variety of appliances has become available. Beginning with lighting and appliances to serve basic needs like cooking and refrigeration, the list has grown to include a myriad of others from home computers and microwaves to water beds, hot tubs and video games.

Households: stoves to water beds

In the **commercial** sector, which includes offices, stores, theatres and restaurants, electricity provides power for lighting, refrigeration, cooking, heating, cooling, as well as a growing variety of office equipment.

Businesses: keeping it all running

Industrial electricity demand is dependent upon the size and types of industries supported in the province. A single large industry can dramatically affect this sector's demand level. But the general trend is one of growth. As industries strive to become more efficient, many are switching from older, fuel-based processes to newer, more effective electro-technologies.

Industries: switching to electricity

A slowing population growth rate

Population growth and changing family structure have both increased the number of electrical customers served by Nova Scotia Power.

Since 1940, the population of Nova Scotia has grown from 569,000 persons to 896,000, representing an average growth rate of approximately one percent per year. However, the number of persons per household has dropped drastically — from 7.8 in 1940 to 2.5 in 1989. Thus the number of households has grown at a far faster rate than the population — from 73,000 households in 1940 to 360,500 households in 1989, or an average of 3% per year.

As the baby-boom generation matures, population and customer growth are expected to slow. Family size, which has been declining in the past due to lower birth rates and the changing structure of the family, is expected to settle around its current level. These factors will tend to slow the rate of growth in the province's electrical needs as the demand for new housing is reduced.

Growth in the provincial economy

Commercial and industrial electricity demand and economic output are closely related. When there is strong economic growth, there is usually a corresponding strong growth in commercial and industrial electricity use. Conversely, a weakening economic growth results in a reduced growth in electricity use. Provincial Gross Domestic Product (GDP), a measure of the total value of goods and services produced within the province, has increased at an average of about 2.5% per year over the past 25 years. Combined commercial and industrial electric energy requirements have grown at approximately 6% per year over the same period.

The historical relationship between economic growth and the growth of electrical demand is expected to remain strong. As commercial activities and industrial processes become more efficient, GDP will continue to increase, creating employment and prosperity, which in turn stimulate domestic electricity demand.

Introduction of new technologies

As new technologies are developed, consumers gain access to an increasing number of electricity-consuming devices. Many of the products we use and take for granted today did not exist just a few years ago, and the rate of technological improvement is not expected to slow down.

Some of this new technology will actually help to reduce electricity demand. For example, continuing improvements in the insulation of new and existing homes will reduce the energy required to maintain a comfortable living space. Also, manufacturers are expected to continue to improve the energy efficiency of new appliances. Therefore, while Nova Scotians will continue to use more appliances, the growth of electricity demand will slow as older units are replaced with newer, more efficient ones.

Of course, while some innovations will save electricity, others will use electricity in new ways. Domestic consumption of electricity for appliances, for example, has increased by 60 per cent over the last decade, and will probably continue to increase. In short, each time you the consumer choose another electrical product, you contribute to the growth of total electricity demand.

WHAT IS A LOAD FORECAST?

How is a forecast prepared?

Forecasts are prepared for each of the sectors; residential, commercial, and industrial. In the residential sector the number of end-uses, or electric devices, is forecast, along with their individual energy requirements, and summed to produce a total sector load. In the commercial and industrial sectors, the strong statistical relationship between the economy and electric load growth is used to build mathematical forecasting models.

These forecasting models take into consideration changes in the economy, demographic conditions, appliance stock, efficiency improvements and even customer preferences.

How well have we forecast?

Nova Scotia Power's forecasting track record is good. Over the past decade we have been able to maintain an above-average forecasting accuracy compared to other utilities in North America.

As a result of good forecasting, and despite the rapid and often erratic growth in electrical load, our planning has allowed us to meet demand requirements consistently.

WORKING WITH THE BEST RESOURCES

Energy resources can be classified into **"supply side"** and **"demand side"** resources. **Supply side** resources are simply the primary energy sources (such as hydro, coal, or oil) that can be used to generate electricity. **Demand side** resources on the other hand, do not generate electricity — but they are nonetheless resources, because they involve serving our need for energy by helping us to use the existing supplies of electricity more efficiently. Since demand side resources can potentially reduce both the costs and the environmental effects of electrical generation, Nova Scotia Power also studies them closely. For this reason, we will deal with them here first:

DEMAND SIDE RESOURCES

New roles for utilities

Utilities have traditionally met increases in their customers' needs by building new generation (power plants). It has been natural for us to think of these plants as a power company's only energy resource. But since the late 1970's, as utilities around the world have heightened their concern with the environmental effects of generation, they have begun to research and implement another resource: the energy efficiency option. This option is sometimes called Demand Side Management (DSM), because it is an attempt to manage the load efficiently and cost-effectively.

NSPC initiatives to date

Nova Scotia Power is no exception to the utility trend towards using demand side management as a resource. On many fronts, we have been working towards higher levels of demand side efficiency. Initiatives to date have included research, interruptible load, public promotion, and an ongoing effort to cost-effectively apply DSM to the utility itself by minimizing energy losses and maximizing efficiency within the Nova Scotia Power system.

RESEARCH

NSPC now has more than ten years' information on customers' usage levels of electricity, gathered through a remote monitoring computer-based system, and has conducted several pilot demonstration projects. The information from this system has formed the basis for an extensive assessment of demand side efficiency opportunities.

INTERRUPTIBLE LOAD

Nova Scotia Power currently provides approximately 150 MW of power, to primarily industrial customers, as "interruptible load." By special agreement, these customers allow us to disconnect their power during times of peak usage on our system. In other words, when demand gets too great for our existing generation to handle, we are able to divert power from "interruptible load" customers to meet the increased need. This permits us to build less generation than would otherwise be required. In return, these customers pay a reduced rate. On a percentage basis, this interruptible load is one of the largest of all utilities in North America.

A NEW ENERGY EFFICIENCY ETHIC

Working together for energy efficiency

We believe that in the decades to come a collective change in "energy attitude," or, in other words, a new Nova Scotian "energy efficiency ethic" will prove to be the most productive demand side resource available to us. Our own Energy Efficiency Ethic statement reads: "Nova Scotia Power is dedicated to achieving the effective use of energy in its operations and by its customers so as to contribute to sustainable development in Nova Scotia."

What is "sustainable development?" As a principle, it was first articulated by the United Nations sponsored World Commission on Environment and Development (the "Bruntland Commission") in its 1987 report "Our Common Future." Its core concept was expressed by the Canadian National Task Force on Environment and the Economy as "the requirement that current practices should not diminish the possibility of maintaining or improving living standards in the future."

Our new energy efficiency ethic has been developing for some time, both within Nova Scotia Power and among our customers, and we will continue both to promote and to encourage it. The potential benefits of this heightened attitude of efficiency are considerable (we'll be looking at them shortly), both in savings to the consumer and in protection of our environment. With this in mind, we have already dedicated $3.5 million over the next five years to working with our customers to contribute to the most effective use of energy. The umbrella program, called Power Smart, was originally developed by B.C. Hydro and has been adopted by many utilities across Canada.

We have estimated that, through carefully designed and implemented DSM programs, by the year 2000/01 system demand could be reduced by about 175 MW at a cost to the utility of about $100 million. By the year 2010, Power Smart induced demand reductions could reach 300 MW.

Conservation works

Nova Scotians have already given Nova Scotia Power an indication that they are willing to purchase energy-efficient products and help us reduce the present rate of electricity demand growth. If, aided by the Power Smart program, more Nova Scotians begin to adopt an energy-efficient ethic, we will be able to considerably reduce demand growth. For more about Power Smart, see page 20.

EFFICIENCY WITHIN THE UTILITY

Nova Scotia Power continues to identify and implement opportunities to be more efficient in its internal use of electric energy. Ongoing internal DSM initiatives include the following:

a) 42,000 mercury vapour street lamps are being replaced with more efficient high pressure sodium lamps. This is expected to yield approximately 2.3 MW.

b) The lighting load in the Barrington Tower, Scotia Square has been reduced by 50% by redesigning the lighting system.

c) The Corporation's new Sydney Zone office has launched several energy efficiency initiatives, including heat pumps, with propane for supplementary heat, and a cooling tower for additional cooling.

d) The Corporation's Ragged Lake computer centre will be heated using heat rejected by the computing equipment.

e) The Corporation's new Bedford/Sackville office is being designed to a high level of energy efficiency.

Other internal efficiency opportunities are being identified and will be implemented.

New power still needed

Despite all of these effective demand side measures, it seems that new generation will still be required at some time in the future. Thus, Nova Scotia Power also continues to look at the sources of primary energy supply available to us, and must choose those most feasible and most environmentally responsible to meet our customers' future needs.

SUPPLY SIDE RESOURCES

Electricity is considered a secondary energy form, or one created by transforming some other form of primary energy. In Nova Scotia, the three main primary energy sources now in use are coal, oil, and hydro.

Seeking new supplies

To meet Nova Scotians' power needs reliably, the Corporation requires a resource margin of approximately 20% in excess of demand (a typical margin for North American utilities, designed to allow for down-time during regular plant maintenance and forced outages). During the 80's, Nova Scotia Power enjoyed a substantial surplus in resource margins through development of Nova Scotian coal to displace foreign oil. This was achieved cost-effectively, as the cost of building and operating new coal-fired plants was lower than that of burning oil in existing units. However, growing demand has now consumed this surplus, and we have had to evaluate and choose which resources will serve to meet the demands of the future.

Judging the supply options

The supply side alternatives include hydro, tidal, natural gas, biomass, in-province purchases, out-of-province purchases, solar, wind, oil, coal, and nuclear. About each alternative we asked the questions most directly affecting our customers' needs: (a) is there an adequate supply? (b) is there a reliable supply? (c) is it economical to use? and d) is it environmentally acceptable? We judged each resource as well according to generation technology potential, practicality and economic benefit to the province.

WHICH ENERGY SOURCES ARE AVAILABLE?

In what quantity?

To see how large a part each of the following resources might potentially play in meeting the energy needs of this province, you might wish to compare the figures in the following review with Nova Scotia's total present annual electrical demand of 1850 Megawatts (MW), and our projected 2010 demand level of approximately 3100 MW (or 2600 MW, taking into account the reducing effect of the proposed Power Smart programs — see p. 20).

Hydro: limited availability

Hydropower has been a consistent part of Nova Scotia Power's resource base. However, at this time, untapped hydro-electric sites in Nova Scotia represent less than 1% of provincial energy needs, and are not without environmental drawbacks. Nevertheless, potential hydro sites are periodically reviewed as conditions change.

Tidal power: requires a large market

The Fundy tides have been studied closely as a potential source of clean power. Tidal power development is still hampered by three major drawbacks: the large required size of cost-effective tidal plants, high capital costs, and the intermittent nature of the power source.

This last drawback makes it impossible to consistently provide enough electricity during high demand times (such as noon and supper hour) without installing some form of energy storage for retiming. Previous studies have investigated the possibility of storing the tidal power energy so that it could be distributed more evenly over the day, but results showed that this approach was not cost effective.

Both the huge size of the various potentially cost-effective projects and the retiming problems just mentioned mean that only a small portion of the electricity generated by these projects could actually be absorbed in the Maritimes: the remainder would have to be exported. Suitable export markets have yet to be developed.

Gas: significant potential

Gas exploration in the vicinity of Sable Island during the early 1980's produced sixteen significant gas discoveries with total discovered reserves sufficient to supply more than 1800 MW of electrical generation for about 35 years — the present demand level of the entire province of Nova Scotia. Although gas may also be used effectively for customer end-uses such as space and water heating, this is far too great a resource to be overlooked: Nova Scotia Power will continue to review the economics of this potential alternative.

The main barrier is the high cost of the technology required in the offshore environment. Due to these high development costs, and the need for a relatively large market to ensure financial viability, the gas fields are likely to require some form of export market. Again, this has yet to be developed.

Biomass: three possibilities

Wood: a small but growing option

The annual amount of wood available as an energy source would provide about 170 MW of electrical generation in addition to current uses. In recent years greater interest in wood fuel has led to the development of modern highly-automated wood-fired boiler plants. Improvements in wood processing, handling and control technologies have made wood burning cleaner, more efficient, and more responsive to demand changes. As a result, there has been an increased effort across the province to identify cost-effective wood-fired generation projects.

Peat: little available

Peat fuel reserves, estimated at 9.6 million tonnes, are located mainly in southwestern Nova Scotia, in the counties of Queens, Shelburne and Yarmouth. These reserves are estimated to be sufficient to support up to 40 MW of electrical generation for 25 years. Although peat is used successfully and economically for generation in other parts of the world, such as Ireland, the prospects for peat in Nova Scotia are not encouraging due to its limited resource, high harvesting and transportation costs, and the availability of relatively cheaper fuels — coal, oil and wood.

Garbage: a potential fuel

In some jurisdictions municipal solid waste (MSW) generating plants (sometimes referred to as waste to energy [WTE] plants) are considered as alternatives to landfilling due to the high cost of developing sites, along with public opposition and environmental concerns. It is estimated that the greater Halifax area produces 300,000 tonnes of garbage annually, an amount sufficient to fuel a 20 to 30 MW MSW plant.

WTE plants can significantly reduce landfill requirements, and the additional benefits of providing steam, electricity and recycled resources make such plants an alternative for municipalities to consider. However, as with all energy projects, MSW brings with it environmental issues, many of which are still under study by municipal and provincial governments.

Purchases: internal and external

Private power plants: NSPC evaluating bids

Privately-owned power generation currently amounts to some 100 MW. Most of this consists of industrial owned co-generation and stand-by auxiliary generation, although there are some very small units owned by domestic customers.

Nova Scotia Power is encouraging privately-owned generation with an ongoing program of in-province purchases: we are currently evaluating bids to supply 50 MW of private sector generation for service by December 1994. Depending on the success of this program, and on evolving technological and economic factors, private generation may play a much greater role. The range of primary energy sources available for private generation remains the same, however, as for utility-owned generation.

NB power continuously in use

Out-of-province power purchases come to us from New Brunswick, since this is the only province with which we are interconnected. New Brunswick Power and Nova Scotia Power do buy and sell electricity on an hour-by-hour basis. As well, Nova Scotia Power continuously monitors the potential for long term out-of-province purchases and sales. Although there are no present long term contracts, such contracts have existed in the past and may again prove desirable in the future.

Solar: unlimited ...

Solar radiation is an unlimited source of energy with little danger of causing significant environmental damage. Solar power thus presents a potentially attractive alternative to present methods of generation, worthy of further study. For the moment, two principal barriers remain.

...but still costly

First, solar energy has a low power density. This means that solar power facilities will require considerable collection equipment —at considerable cost. Second, solar radiation is an intermittent source of energy, subject to day/night cycles, seasonal variations and weather conditions. This means that unless some form of economical energy storage is provided, a solar electric plant would provide no dependable capacity. Such storage has yet to be demonstrated to be economically competitive with conventional generation. Solar water heating does, however, offer some potential to displace electric water heating.

Wind: a promising technology

Wind is another clean, renewable resource worth further study. We are continuing to monitor this technology, and, in fact, own and operate a 300 kW (0.3 MW) unit in Cape Breton. As well, some customers own small units and have them interconnected with our system.

In recent years, wind turbine costs have steadily decreased, while reliability and performance have improved. However, when compared with conventional means of utility-scale electrical generation, wind turbines are still not currently cost competitive.

Aside from the issue of cost, the main problem with wind is the same as for most renewable energy sources: it provides an intermittent source of power, and therefore requires backup generation for retiming or standby, as it may not be producing when needed.

Oil: an unstable resource...

Due to continuing concerns about stability in the Middle East, the world economic climate is clouded by an uncertainty over oil prices. Over 60% of world oil resources are in the Middle East, with over 40% in the three countries of Iraq, Kuwait, and Saudi Arabia. We are often reminded of the potential for disruption of world oil supply, with consequent oil shortages and price increases in all energy sectors.

Our policy: use oil strategically and only where it is clearly most cost effective

Nova Scotia Power will continue to limit its dependency on oil for generation, in keeping with plans of the province of Nova Scotia to lessen the use of imported fuel. However, we will continue to use some oil, as oil-fired power plants remain the most cost-effective alternative for peak power generation (for example, at noon and supper hours). As well, the existing oil-fired station at Tufts Cove continues overall to be cost effective to operate.

Coal: the richest Nova Scotian resource

Coal is an abundant energy resource for Nova Scotia. In the late 1970's total Nova Scotian coal reserves in excess of 2.7 billion tonnes were identified. Although some reserves are scattered throughout the northern sections of the province, the vast majority are located in the Sydney coal fields.

Recoverable coal reserves, using present mining technology and present market prices, are estimated at 900 million tonnes. Present and future production rates allow for 200-250 years of production.

A long term, secure supply

Compared with oil, coal as an energy source is far more stable and secure. The construction of a new coal-fired plant at Lingan in the late 70's and early 80's, the recent conversion of an oil fired unit at Point Tupper to coal, and the introduction of the most modern, efficient coal-fired technology at Point Aconi have allowed the Corporation to achieve significantly lowered financial risk from fluctuations in world oil prices. All indications are that coal, in the long term, will continue to be less risky than oil.

Nuclear: cost effective but controversial

Approximately one quarter of known world uranium reserves are found in Canada — this represents a secure supply for the foreseeable future.

Although there are over 400 nuclear reactors in service worldwide, supplying about one sixth of the world's electricity needs, opinions differ throughout the world on the future of nuclear power development. Nuclear power has proven, in most cases, to be a reliable, cost effective source of electrical generation which can contribute to stable power costs and a secure fuel supply. On the other hand, some plants have been plagued with high capital costs, as well as a lack of public acceptability due to concerns for health, the environment, waste disposal and safe plant operation. These concerns remain potential obstacles for the development of this technology in the near future in Nova Scotia.

Still to coal ... for now

The present lifetime cost of a nuclear plant is similar to that of a coal-fired plant. Coal plants, however, can be built in smaller unit sizes, are generally lower in capital costs, have the potential to burn oil or gas, and have the inherent advantages of coal price stability and indigenous supply on their side. If for some reason, perhaps environmental, coal becomes less attractive overall than nuclear, Nova Scotia Power would have to seriously consider the nuclear option.

WHICH SOURCES OF PRIMARY ENERGY WILL MEET NOVA SCOTIA'S NEEDS?

Further **hydro** development in Nova Scotia is not expected to be significant since nearly all cost-effective sites have been developed. However, specific identified sites will be reviewed periodically as economic conditions change.

Biomass resources in Nova Scotia (wood, peat, and municipal solid waste) may result in the construction of a limited amount of biomass-fired generation, particularly wood and MSW. Nova Scotia Power's role in such projects would likely be that of energy purchaser, rather than owner/operator.

The **nuclear** option, while appearing environmentally and economically attractive in the long term, is not yet in commercial operation in a unit small enough for our needs (that is, about 300 MW, as opposed to the currently operating units at about 600 MW). The nuclear option also has high early year costs, and may lack public acceptability.

In the past two decades, we have successfully reduced our dependence on **imported oil** — an insecure, unstably priced resource. However, we will likely continue to use some oil in our existing oil-fired plant and for future new oil-fired combustion turbines, which remain the most cost-effective alternative for peak power generation (for example, at noon and supper hours).

When the supply side alternatives are weighed, the choice for the foreseeable future seems clear. **Nova Scotia coal** seems to offer the greatest overall benefit, and continues to be the prime source of generation in Nova Scotia. To the extent that they are necessary to serve customer demands, major system additions over the next decade will likely use this indigenous resource because of its secure local supply and its cost advantage to both the utility and its customers.

While coal continues to figure prominently in Nova Scotia Power's planning, we also continue to monitor developing technologies, and to pursue resources capable of meeting our environmental and cost objectives.

SETTING PLANNING PRIORITIES

A delicate balance

Once we have forecast future demand, and identified feasible resources to meet that demand, we must work to identify the balance of energy efficiency measures, primary energy sources, and technologies, that will best serve our customers' needs, and the needs of our environment.

Overriding goals

At the same time, we must address a complex network of goals and concerns, both internal and external to the corporation (see **Objectives**, inside back cover). These include such areas of corporate concern as finance, safety, human resources, technology/R&D, the environment, and customer service.

Our guiding principles

As we work to meet our customers' needs through our corporate objectives, our overriding guidance derives from our mandate:

1. To satisfy the needs of Nova Scotia for reliable, economic electrical service in a safe, effective and environmentally responsible manner while fostering the wise and efficient use of energy,

and, as a crown corporation,

2. to serve the broad social and economic interests of Nova Scotia.

In other words, as we work to provide electric service to our customers, we seek ways to provide it (a) reliably, (b) economically, and (c) in a safe, effective and environmentally responsible manner.

RELIABLE POWER

Reliability: cutting down on outages

Power reliability is measured in terms of frequency and duration of interruption — or in other words, how often power outages occur, and how long they are when they do occur. To the domestic customer, outages may be merely annoying, but to business and industry —which are increasingly relying on sensitive electronic equipment such as computers —outages can mean time and money lost.

Over the next ten years, customer demand for increased reliability of power supply is expected to grow. Increased dependence on computers, electronic controls and solid state power devices in the home, in business and in industry is a major factor driving this change in customer expectations.

Part of reliability is having enough electricity. Nova Scotia Power must be able to meet its customers' needs even at times when some power plants are out of service for repairs. To ensure that this can be done, we (like most utilities) maintain a resource margin of 20% of our customers' needs.

ECONOMICAL POWER

What is the value of electricity? What are Nova Scotia Power's customers really getting for their money? If you are an "average Nova Scotian," you are paying about $700 per year for a total 9000 kilowatt hours of electricity. To put this in human terms, the average healthy non-athlete doing manual labour would expend the equivalent of 200kwh of energy at work over a year. So the 9000 kilowatt hours you use in a year, keeping your food cold, vacuuming your rugs, playing your VCR, and so on, is the electrical equivalent of 45 person-years of labour. At a total cost of $700.

How do today's bills compare to bills in the past? The average Nova Scotian's electrical expenditures have remained stable at about 2% of personal disposable income since 1977, despite a near doubling of the per capita consumption of electricity in the same period.

We can compare cost of power to the cost of other basic needs by measuring power rates against the Consumer Price Index for Canada. Over the past decade, Nova Scotia Power has been able to hold rate increases on average to slightly less than general inflation.We have achieved this through favourable fuel purchases, continuous attention to cost control, and productivity enhancements. Electricity prices to residential customers in Nova Scotia are now lower than two thirds of the other major utilities in North America. Average electrical prices in Nova Scotia, however, remain almost the *highest in Canada*, presenting an ongoing challenge to the Corporation.

As for the future, inflationary trends are expected to continue impacting Nova Scotia Power costs. But whereas the Consumer Price Index is forecast to increase annually, and, although considerable expense must be directed towards protecting our environment, our objective is to keep long term increases in the price of electricity within the rate of inflation, and to avoid burdening the consumer with extreme or widely fluctuating rate increases. This will be achieved through continued efficiency improvements, effective use of new technology, and economies of scale. Our goal, a yardstick by which we measure planning options, is, on average, *no increase in the real price of electricity over the next ten years.*

ENVIRONMENTALLY RESPONSIBLE POWER

Our commitment: to respect and protect

Nova Scotia Power shares in the desire of Nova Scotians to enjoy the benefits of a sound economy in a healthy environment, and is committed to conducting its business in a manner which is respectful and protective of the environment. Therefore environmental concerns are fully integrated into our planning. At this time, public concerns are focused on the greenhouse effect and acid rain.

Other environmental initiatives

Nova Scotia Power has initiated additional environmental programs in a number of other areas, including environmental assessment, design and construction practices, air quality monitoring, PCB management, fish management, osprey nest management, vegetation control, and community impacts. For further details, see appendix, p.31, and write for the booklet "Nova Scotia Power — Environmental Practices."

Potential climate change

Throughout the world, nations are attempting to deal with meeting energy needs in an economical and environmentally acceptable manner. The major focus of concern is potential global climate change resulting from the release of greenhouse gases. Greenhouse gases include water vapor, carbon dioxide, methane, ozone, nitrous oxide, and the chlorofluorocarbons (CFCs). All but CFCs result from natural as well as man-made processes.

It is estimated that carbon dioxide (CO_2) represents approximately one-half of the gas that contributes toward global warming. Carbon dioxide emissions arise from the use of all carbonaceous fuels, whether for transportation, heating or electrical generation; CO_2 is also emitted in many other natural and man-made processes, the latter including incineration of solid wastes and many industrial processes.

Working as part of the solution

The CO_2 contribution from coal fired power plants world-wide is 8 per cent. Although Nova Scotia Power's CO_2 emissions are less than 1/60 of 1 per cent of the world-wide, man-made contribution to the calculated warming, ***we are concerned — recognizing that we are part of the global community — and intend to be part of the solution***. Our initiatives are described below, under the heading "Technology: Making Power Cleaner."

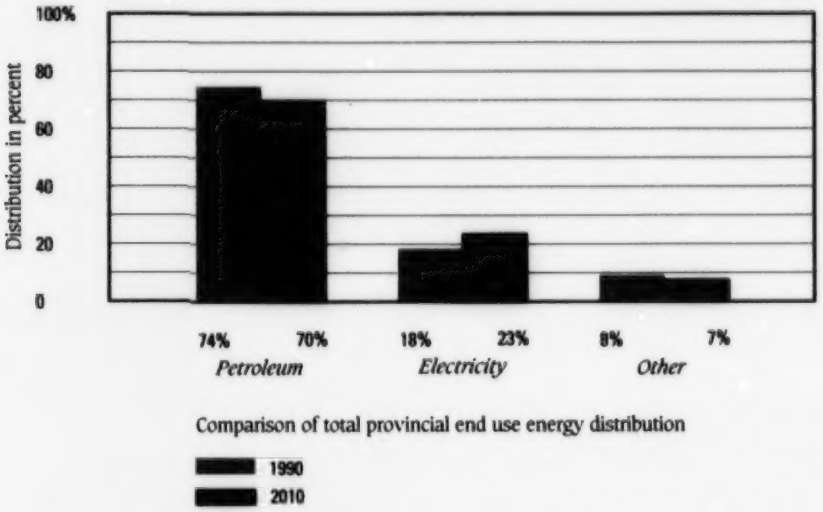
Acid rain initiatives underway

In Eastern Canada, an additional focus of environmental concern is acid rain, caused by release of SO_2 and NO_X gases. Here, too, Nova Scotia Power has committed to initiatives, also described below.

Looking at the whole picture

To properly understand our initiatives, and their place in the whole solution to Nova Scotia's environmental concerns, it is important to know that electricity now provides 18% of Nova Scotia's end use energy. Although by 2010 we expect that 18% share to grow to 23%, 77% of provincial end use energy would still be consumed as other than electricity. Therefore, as Nova Scotia Power continues to do its part in using technology and energy efficiency measures to benefit our environment, practical efforts must address all energy sectors and sources to ensure that we are overall cost effective in reducing the environmental impact of energy use in the province.

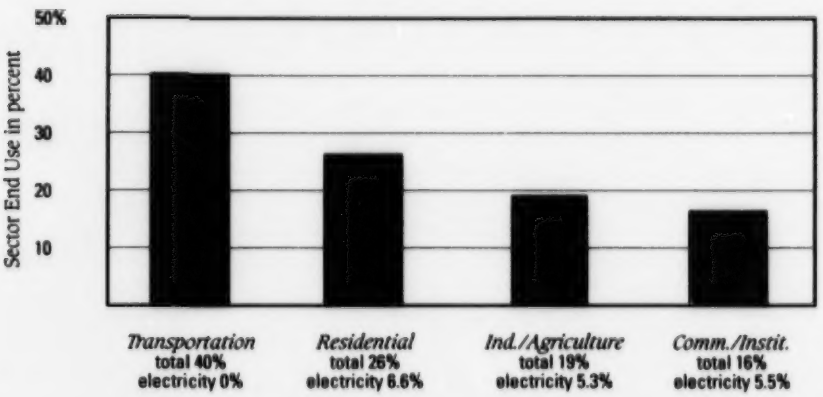
Energy End Use in Nova Scotia: 1990 and 2010



Comparison of total provincial end use energy distribution

Electricity and Sector End Use

Practical efforts to meaningfully reduce total Provincial energy consumption must address all sectors and sources



Sector Energy Use as Percentage of Provincial Total End Use

Electricity: often the environmentally preferred choice

It should be noted that the projected growth in electricity as a percentage of energy end use could actually mean real environmental gains for our province. Particularly in industry, electricity is increasingly becoming the energy of environmental choice — and can present net environmental benefits to the industry and the province when adopted.

Cleaner pulp processing

In the pulp and paper industry, for example, one company which once used a chemical-based pulping process has now converted to thermo-mechanical pulping. This means fewer trees are harvested: whereas in the old chemical process only 70% of a tree was used, now almost 100% can be used, thanks to an electrotechnology.

Cleaner steel processing

Another example of an increase in Nova Scotia's electrical demand which represented an environmental benefit is the Sysco electric arc furnace conversion. Here, a modern electric furnace replaced the use of coke in an aged blast furnace. As Sysco switched to the electrical process, the net CO_2 emissions in the province were reduced, even though Nova Scotia Power's emissions were increased because of the increase in demand. Thus, a seeming environmental loss to Nova Scotia Power was actually a net gain for the environment of our province.

Coal can be cleaner

Coal is expected to continue as the basis for meeting Nova Scotia's electrical needs, as it remains a major energy source across Canada, North America and the world. And as long as coal remains the primary resource available in Nova Scotia for use as a fuel in power plants, we will need to work to achieve cleaner power.

Nova Scotia Power taking the lead

Coal can meet present environmental requirements through the use of available technologies, and should be able to continue meeting requirements in the longer term with more advanced technologies. We will look at some of those technologies below, under Technology: Making Power Cleaner.

The challenge for Nova Scotia Power is to be among the world leaders in clean, coal-fired generation. It is a challenge we will meet.

TAKING UP THE ENVIRONMENTAL CHALLENGE

Managing for our environment's sake

As we have seen, electrical demand in Nova Scotia is forecast to increase, with a potential doubling by the year 2010. Increase in demand would mean new generation. And with new generation comes the potential for environmental impacts. To minimize these impacts, we are committed to being environmentally friendly in our activities.

Two methods: cleaner generation and energy efficiency

We have already begun to adopt new, cleaner generation technology. But technology is not enough. We must go beyond to a new energy ethic, aimed both at using less energy and at achieving greater efficiencies with the energy we use. In the following, we will look at both management options: the cleaner generation option and the energy efficiency option.

Nova Scotia Power has developed three alternative planning directions covering the next twenty years. For a summary of the predicted effects of these potential directions on emissions levels, see the charts at the end of the last section of this document, "Three Planning Directions."

For a fuller discussion of NSPC emissions initiatives, write for our booklet entitled ***Control of Atmospheric Emissions****.*

TECHNOLOGY MAKING POWER CLEANER

There are two main emissions concerns today: acid rain and the possibility of global warming. Acid rain is the result of SO_2 and NO_X emissions. Global warming potentially results from "greenhouse gases" such as CO_2 and methane. Nova Scotia Power is committed to achieving over time a continued reduction in our emissions of SO_2, and NO_X, and to cost effectively controlling greenhouse gasses.

ACID RAIN SOLUTIONS

Nova Scotia Power has been, and will continue to be, involved in a number of aggressive technology programs to reduce the SO_2 and NO_X emissions which cause acid rain.

The newest, most cost-effective commercially available technology in the battle against acid rain is the Circulating Fluidized Bed (CFB) combustion process, which is capable of considerably reducing SO_2 & NO_X emissions without the need for scrubbers (see below) and other clean-up systems. This is the technology that will be used at the new Point Aconi plant.

Compared to conventional pulverized coal plants, the Point Aconi circulating fluidized bed combustor will achieve a 90% reduction in sulphur dioxide (SO_2) emissions and a 65-75% reduction in nitrogen oxide (NO_X) emissions.

Point Aconi represents the leading edge of commercial coal-fired electric power technology. CFB has been tested and put into successful commercial operation in hundreds of plants worldwide.

The most widely used commercially available alternative to fluid bed technology for the control of SO_2 emissions is the flue gas desulphurization system, often referred to as a scrubber. The scrubber removes the oxides of sulphur that are a major gaseous pollutant resulting from the burning of coal. Use of scrubbers can result in a 90% reduction in SO_2 emissions, but offers no reduction in NO_X emissions.

In 1990, Nova Scotia Power began buying lower sulphur oil for the Tufts Cove generating station. This reduces SO_2 from this station by 10–15%.

Reductions in SO_2 emissions will continue this year when we begin to use lower-sulphur coal from the new Westray mine in Pictou County at the Trenton station. This coal has almost 75% less sulphur content than other Nova Scotian coal. The use of this coal will reduce total SO_2 emissions from Trenton by 35%, although the capacity of the station will approximately double.

The reduction in emissions will continue as the Point Aconi station will allow Nova Scotia Power to divert high-sulphur coal from the Point Tupper and Lingan stations to Point Aconi. This diversion will free the lower-sulphur coal for use at the older plants, where it will contribute to the reduction of SO_2 emissions from Point Tupper and Lingan.

Controlling NO_X since '76

In 1976, Nova Scotia Power began the design and installation of our first low NO_X furnaces. The control of NO_X emissions has continued with every new unit introduced into the system including the Point Aconi CFB unit, which will reduce NO_X emissions by 65-75% as compared to more conventional furnaces.

GREENHOUSE EFFECT SOLUTIONS

Addressing the whole problem

As we have seen, CO_2 has been identified as one of a number of contributors to the concentration in the atmosphere of man-made gases capable of blocking the natural cooling process of the earth. CO_2 emissions present a potentially serious challenge, as there is no viable technology for the capture and disposal of CO_2 once formed. In light of this "technology gap," Nova Scotia Power is focusing its efforts on the broader issue of reduction of greenhouse gases, by pursuing several initiatives which can be cost effective on their own merits.

Controlling Methane

The first initiative is a plan to burn methane gas from the mining operations of the Cape Breton Development Corporation. The methane combustion would displace coal combustion and, as methane molecules trap many times more heat in the earth's atmosphere than do CO_2 molecules, there would be a substantial decrease in net greenhouse gas emission. This plan could provide compensatory reductions for the province equal to the emissions from about 500 MW of coal-fired power. This is equivalent to a reduction of 40% in Nova Scotia Power's total CO_2 emissions in 1995 or a 25% reduction in 2010.

Efficiency our policy

The second initiative is our ongoing policy of plant efficiency improvement. Nova Scotia Power is continuously improving our plants, making them "work better" to produce more energy with less effort (for example, by burning less coal in a thermal plant). The result: emissions levels per unit of energy generated are reduced. This is particularly significant in the case of CO_2, where there are so few alternatives for reductions. Plant efficiency improvements have been completed, are ongoing, or are planned for all of the hydro systems and the thermal plants at Glace Bay, Lingan, Point Tupper, Trenton, and Tufts Cove.

Beyond generation, we also minimize energy losses to the most cost-effective extent in designing and choosing equipment for our transmission and distribution system. Our system losses (as a percentage of load)are among the lowest in Canada and we continue to seek out system operating efficiency improvements.

The demand side alternative

Our third initiative is to attack the problem of CO_2 emission at its root. Nova Scotia Power's total CO_2 emissions will increase as our fossil fuel based generation grows to meet customer demand. In fact, for fossil fuel based systems, CO_2 emissions grow in almost direct proportion to demand. In the absence of an option to cost effectively switch to less carbonaceous fuels, supply side management may not be enough. As Nova Scotians concerned about our environment, we must examine the demand side management alternative —that is, energy efficiency.

ENERGY EFFICIENCY: USING LESS ENERGY BETTER

Energy efficiency can save money

From a customer perspective, the energy efficiency option offers more than just environmental benefits. New, utility-promoted efficiency options will allow consumers to reduce electricity consumption without a change in lifestyle, while at the same time saving money. This is a big part of what we mean when we talk about "using less energy better."

The tools: education to incentives

We have already introduced our **Power Smart** program (p. 2). This program will form the centrepiece of Nova Scotia Power's demand side energy efficiency efforts. Power Smart will encourage customer energy efficiency in three principal ways. First, we will provide our customers with information to help them choose energy-efficient and environmentally sound technologies for home and business. Second, we will ensure, through the development of trade allies, that energy efficient products are available to Nova Scotians at fair prices. Finally, we can also institute incentive programs to encourage Nova Scotians to buy these energy-efficient products (see "Direction 3: Increased Energy Efficiency," below.)

The programs: something for everyone

Programs being implemented will encourage the use of low flow shower heads, water heater blankets, energy efficient lighting, and other efficient technologies in homes, businesses, and industries. At the same time we will work to see new home construction standards established. In addition, interested customers will be provided with a self-audit package, allowing them to determine cost effective ways in which their homes can be made as energy efficient as possible. A step-by-step cost calculation guide could help them carry out the most efficient energy retrofits and renovations.

In short, Power Smart will introduce customers to the many ways they can greatly reduce personal and corporate power bills. Lighting, for example, accounts for about 35% of energy use in commercial buildings. Thus, Power Smart will show customers the wide range of new energy efficient lighting available, even providing an energy saver calculator to help customers determine the payback for new lamps and fixtures.

The Middleton program

Initial public interest and trade ally support for these and other initiatives have been encouraging. And one ambitious public initiative has already been launched in Middleton, Annapolis County, under the name "The Middleton Water/Energy Conservation Project." The citizens of an entire town have moved not just to use Power Smart ideas like water heater blankets and low-flow shower heads, but to allow themselves to be monitored in their power use. The program was initiated by the Clean Annapolis River Project, and Nova Scotia Power is working as part of a group effort with several corporations and government departments to provide water heater blankets and other energy-saving devices to Middleton citizens.

The key: new tech

There are many industrial players in Power Smart as well. Nova Scotia Power will participate, with industry allies, in the application of new energy-efficient technologies for the consumer. We also expect to see initiatives from industry groups such as the Canadian Manufacturers Association and from the industries themselves, as they become Power Smart participants and achieve new efficiencies in their own operations through the application of high efficiency motors, variable speed drives and other electrotechnologies.

Energy efficiency begins at home

The Corporation will lead Nova Scotia businesses in the adoption of energy efficient technologies in its business operations. In Nova Scotia Power facilities like Barrington Tower at Halifax's Scotia Square and the Ragged Lake computer centre, energy efficient lighting and air conditioning equipment and cost effective insulation are being put in place. As well, Nova Scotia Power is examining the extraction of hot water from the steam cycle of our Tufts Cove Plant for use in district heating.

Energy efficiency works

How much of the next 20 years' increase in demand can we cost-effectively reduce by efficiency measures? An encouragingly large amount. Full implementation of Nova Scotia Power's Power Smart program together with interruptible load could reduce the demand growth by some 350 MW by 2001 and 500 MW by 2010 — enough, as we will see, to defer or eliminate the need for some new plants.

THREE PLANNING DIRECTIONS

The number of potential courses of action Nova Scotia Power might take to meet Nova Scotia's electricity needs is virtually unlimited. And because of the many uncertainties inherent in long term forecasts and assumptions, it is impossible to develop a single "best" long term plan for the next twenty years. What we have done instead is to examine and compare the potential costs and benefits of a range of plausible directions.

Nova Scotia Power has developed three general planning directions for meeting Nova Scotians' electrical energy needs in the next twenty years. All three directions combine a mix of supply and demand side management options with various emissions controls. This is not to suggest that there are only three possible directions for the utility to take. Our intent is to explain the general choices we now face.

Note: All dates mentioned in the following directions are in fiscal years. Fiscal years are measured from April 1st of the previous year to March 31st of the fiscal year (fiscal 1992, for example, is April 1, 1991 to March 31, 1992).

DIRECTION 1: STATUS QUO

Direction 1 contains both clean power and conservation initiatives. This course of action is most similar to what Nova Scotia Power is doing today. Its main initiatives are as follows:

Clean Power initiatives

- Initially, the focus of Nova Scotia Power's expenditures would be on upgrading existing plants for efficiency. This would include improving hydro plant efficiencies by replacing decades-old runners (the "water wheel"), reconfiguring older plants to increase output and efficiency, and fine tuning newer thermal plants.
- In 1992, Trenton generator 6 will come on line. This unit, as well as the existing Trenton 5 unit, will burn low-sulphur coal from the Westray mine in Pictou County.
- In 1994, the Point Aconi Circulating Fluidized Bed generating station will come on line, representing the cleanest coal-burning technology available.
- Combustion turbines would be installed in 1997 and 2004.
- Point Aconi 2 (1999) and 3 (2002) would come on line, along with additional units using more advanced coal-fired technology in 2005 and 2008.

Energy efficiency initiatives

- Nova Scotia Power would increase interruptible load from some 150 MW in 1991 to 180 MW by 2001 and 210 MW in 2010.
- Nova Scotia Power would continue Power Smart promotion and information efforts, with a total targeted demand reduction of 40 MW by 2001 and 60 MW by 2010.

DIRECTION 2: MINIMUM EMISSIONS

Direction 2 focuses on minimizing the atmospheric emissions from NSPC plants. All of the possible planning directions are designed to fully meet all environmental regulations. The "minimum emissions" direction presented here, however, goes beyond what is required to a significant degree, but still does not present the limits of what might be technically achievable. Its main initiatives are as follows:

Clean Power initiatives

- At first, as with Direction 1, the focus of Nova Scotia Power's expenditures would be on upgrading existing plants for efficiency.
- As soon as feasible, emissions controls would be retrofitted to all major units.
- In 1992, Trenton generator 6 will come on line, as in Direction 1.
- Beginning in 1993, new prototype low-NO_x burners would be retrofitted to selected units.

- The Lingan methane burn plan would go ahead in 1995, to offset CO_2 emissions.
- In 1994 and 1999, phase 1 and 2 of the Point Aconi station would come on line.
- Combustion turbines would be installed in 1997 and 2001.
- Beyond Point Aconi 2, two nuclear units, which have no SO_2, NO_X, or CO_2 emissions, would be added. For the purposes of this plan we have used the dates 2003 and 2009 to introduce these two plants.

Energy efficiency initiatives

- Nova Scotia Power would increase interruptible load from some 150 MW in 1991 to 180 MW by 2001 and 210 MW in 2010.
- Nova Scotia Power would continue Power Smart promotion and information efforts, with a total targeted demand reduction of 40 MW by 2001 and 60 MW by 2010.

DIRECTION 3: INCREASED ENERGY EFFICIENCY

Direction 3 focuses on reducing environmental impacts and controlling power rates through energy efficiency programs. Its main initiatives are as follows:

Clean Power initiatives

- At first, as with Directions 1 and 2, the focus of Nova Scotia Power's expenditures would be on upgrading existing plants for efficiency.
- As in Directions 1 and 2, Trenton 6 will come on line in 1992 and Point Aconi 1 in 1994.
- Point Aconi 2 (1999) and 3 (2002), and a unit using more advanced technology in 2007, would also be installed.

Energy efficiency initiatives

- Nova Scotia Power would increase interruptible load from some 150 MW in 1991 to 180 MW by 2001 and 210 MW in 2010.
- Nova Scotia Power would expand Power Smart to include incentives and rebates to consumers buying energy-efficient products and adopting energy-efficient practices.
- Total spending on the Power Smart program in this case would be about $100 million to 2001, or 15 times greater than in the first two Directions, for a total targeted demand reduction of 175 MW by 2001.
- Over the following ten year period to 2010, additional spending on the order of $100 million would result in a total demand reduction of about 300 MW.

MEETING CUSTOMER DEMAND

The following graphs summarize the forecast future electrical demand in Nova Scotia, allowing for "natural" efficiency improvements, interruptible load and Power Smart. They also show the 20% resource margin and possible supply side resources needed to meet our customers' requirements.

First, there is a certain amount of "natural energy efficiency" taking place over the years. Manufacturers are "naturally" improving the efficiency of the appliances they build and sell. People are "naturally," because of the prominence today of environmental issues, becoming more aware and efficient in their energy use. These natural trends are forecast to occur without Nova Scotia Power's direct intervention and are expected to help reduce demand below where it might otherwise have been expected to be. This demand reduction would be approximately the same amount under each planning direction.

Second, some larger industrial and commercial customers have agreed to be placed on an interruptible power supply. This means that during periods of peak need in the province, when generation may be in short supply, these customers waive their use of power to allow Nova Scotia Power to supply other customers. This in turn reduces the amount of generation required on the system—again, by the same amount under each planning direction. Today, there is about 150 MW of interruptible load. By 2001, this is forecast to grow to 180 MW, and by 2010 to some 210 MW.

Finally, all three planning directions include some energy efficiency initiatives on Nova Scotia Power's part. But whereas the demand depicted in the graphics of Directions 1 and 2 reflects initiatives in the area of information-providing only, Direction 3 reflects the predicted effects of NSPC's incentive programs on demand side decision-making, and thus ultimately on customer electrical demand.

Increased energy efficiency

A generator eliminated and some deferred

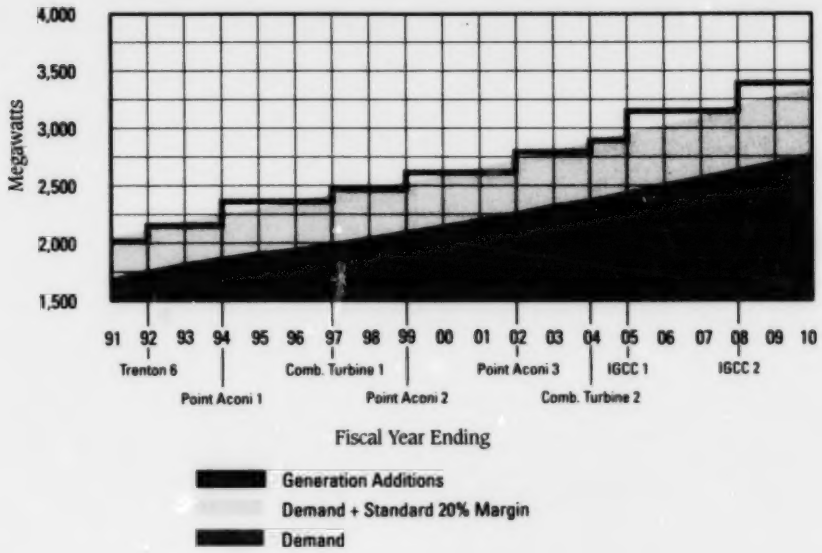
or

All generators deferred

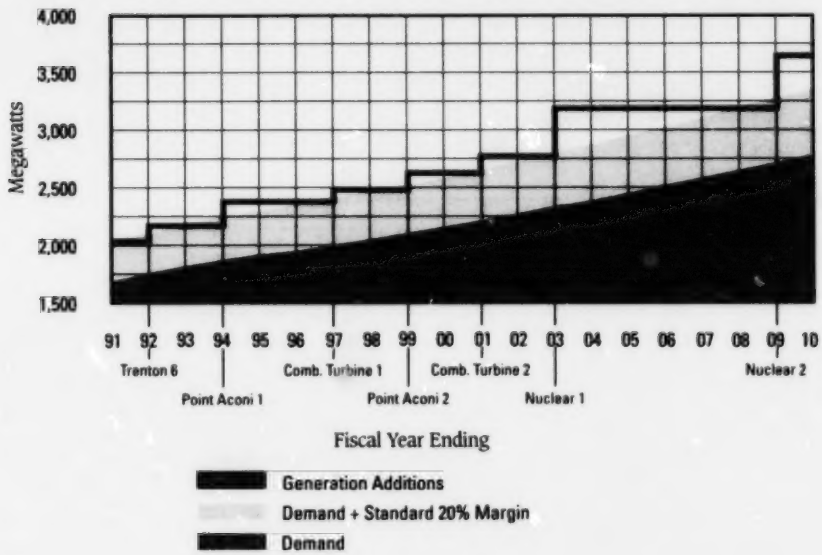
You can see the end result of these increased energy efficiency initiatives by comparing the graphs for Direction 1 and Direction 3. Under Direction 3, for the assumptions used, the need for one combustion turbine is completely eliminated, and future base load plants early in the next decade are deferred as well.

Keep in mind that these are possible directions as opposed to specific plans. For example, Direction 3 assumes that a combustion turbine will be eliminated in 1997 and in addition some of the later generating units deferred. As an alternative under Direction 3, rather than eliminate the addition of a specific combustion turbine, all plant units might be deferred anywhere from one to three or four years.

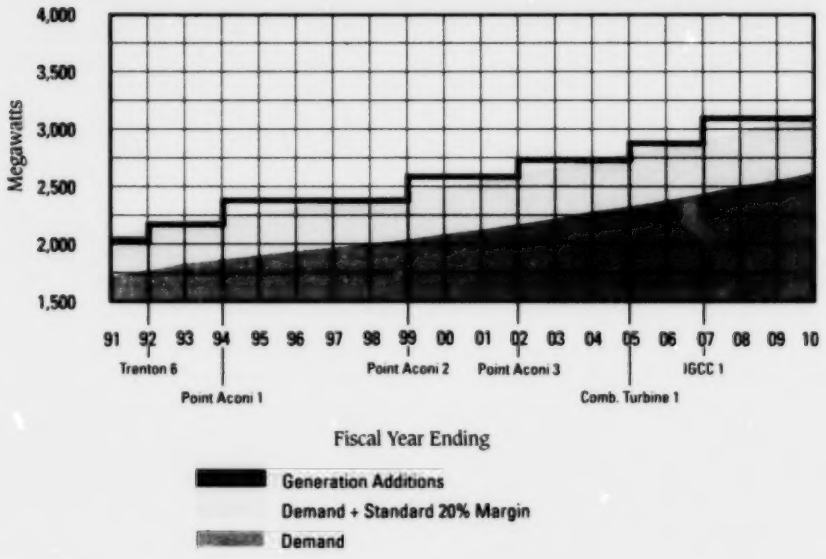
Direction 1: Status Quo



Direction 2: Minimum Emissions



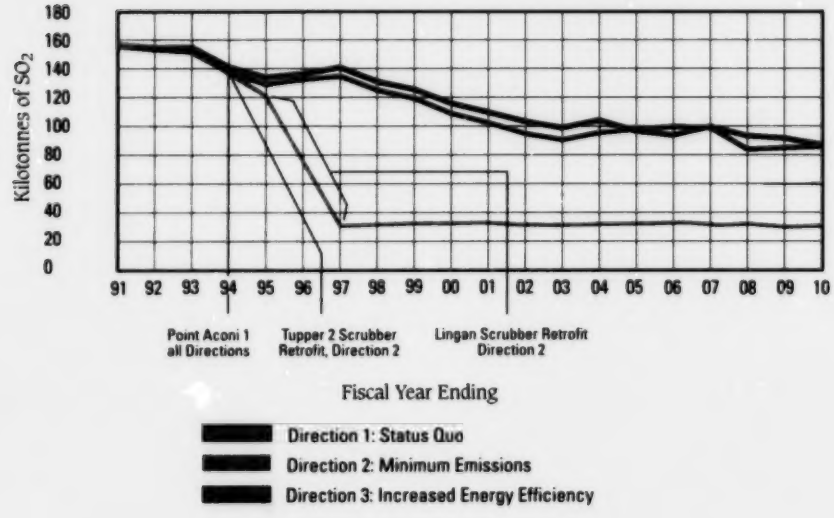
Direction 3: Increased Energy Efficiency



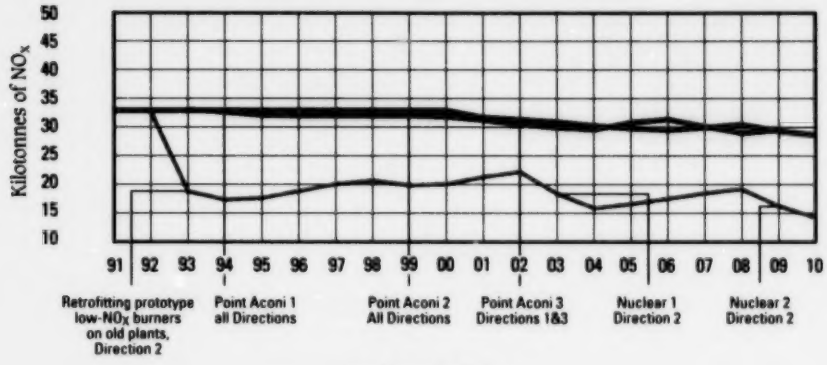
WORKING FOR CLEANER POWER

Emissions trends for all three plans can be seen most clearly in graphic form. Note on the following graphs the critical points where initiatives will affect emissions levels— for example, Point Aconi's effect on SO_2 emissions in all three planning directions, or the nuclear plants' effect on CO_2 emissions in Direction 2.

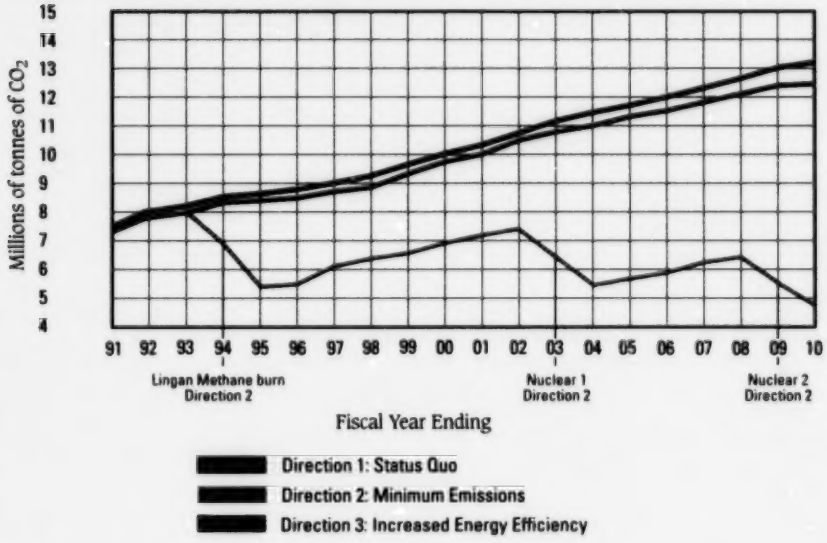
SO_2 Emissions Summary



NO_X Emissions Summary



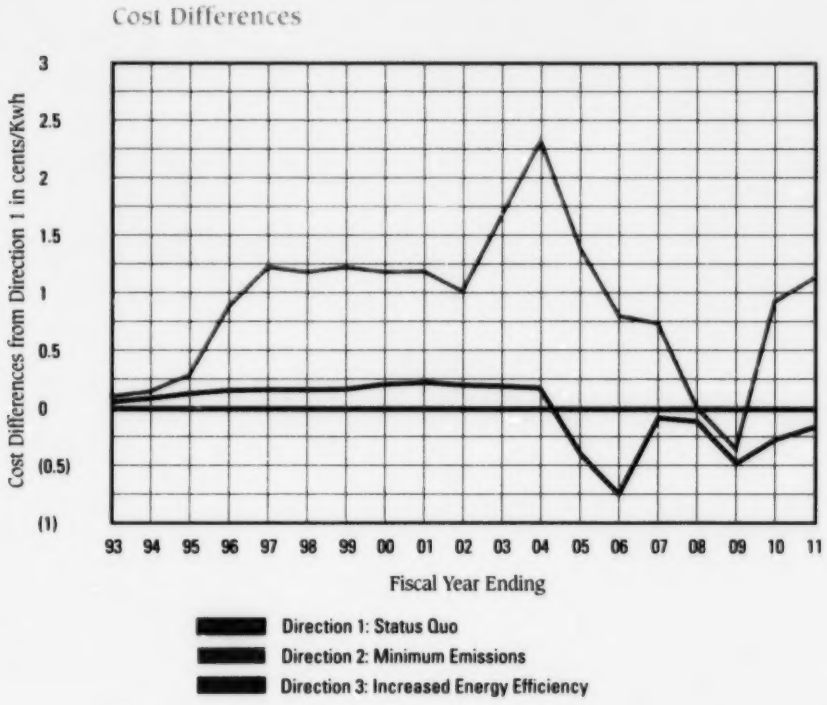
CO_2 Emissions Summary



WORKING FOR ECONOMIC POWER

Nova Scotia Power's financial objective is to maintain rate stability and adequate revenue flow so as to achieve with our customers and creditors a high level of confidence in our financial health and integrity. In order to gain the best rates for our customers, we must ensure that the Corporation's economic and financial decisions are made on the basis of the lowest long term cost. The challenge in planning this way is to balance the lowest long term cost in relation to the lowest immediate cost. This can only be done by planning far enough into the future to see the long term effects of today's decisions. Hence, for example, a twenty year plan.

As we operate within this long time horizon, we will be seeking to hold rate increases on average over the long term equal to or less than inflation.



DIRECTION 1: STATUS QUO

Expenditures on demand side energy efficiency in Directions 1 and 2 are limited to promotion only ($5–10 million by 2001 and $10–20 million by 2010). The expenditures most affecting power rates are those made on supply side technology — mainly on upgrading existing plants and building needed new plants. In Direction 1, costs for retrofitting existing plants for cleaner operation have been kept to a cost-effective minimum while meeting all regulations.

DIRECTION 2: MINIMUM EMISSIONS

The costs of this planning direction are significantly greater than for either of the others, primarily due to the retrofitting of emissions control devices on all major generating units and the high early year expenses of the nuclear plants.

DIRECTION 3: INCREASED ENERGY EFFICIENCY

Expenditures on demand side energy efficiency in this planning direction include rebates and incentives, and will total some $90–100 million by 2001 and an additional $100 million by 2010. As with any long range projection, the costs and the environmental end results of Direction 3 are difficult to project with accuracy, and thus both the power rates and the emissions results shown for this planning direction should be judged with that in mind. Admittedly the actual effects of Power Smart incentives on people's energy efficiency habits are still somewhat unknown and even when the results of Power Smart do start coming in, the program's actual impact on overall customer demand will not be directly measurable. This is because there are many other factors affecting demand besides Power Smart, such as economic conditions and yearly weather variations.

As a result of these uncertainties, the cost of achieving the projected 175 MW of demand reduction by 2001 may vary somewhat from the estimate. But whatever the initial results of Power Smart, they will help to gauge the effectiveness of the program, and Nova Scotia Power would continue to use those results to adjust the program throughout its life-span, always aiming for a reasonable balance between cost and benefit.

CONCLUSION

Although there are many uncertainties and important input factors over which Nova Scotia Power has no direct control, a flexible approach to planning for our future will ensure that:

- Nova Scotians will enjoy reliable, high quality electric service,
- Nova Scotians will have environmentally sound electric service,
- Nova Scotians will have affordable electric service,
- Nova Scotians will have efficient and effective electrical service.

Our present direction can be summarized as an attempt to promote demand side management and purchases from independent power producers to the maximum extent to which it is cost effective for our customers, and to fulfill the balance of customer requirements with the appropriate mix of supply side alternatives. At present the most cost effective, environmentally acceptable supply mix appears to be a combination of commercial state-of-the-art generation using indigenous coal and combustion turbines to help meet the load at times of peak need.

IS OUR PRESENT DIRECTION APPROPRIATE?

- Do you want us to accelerate demand side management?
- Should we exceed expected environmental regulations to foster a cleaner environment if in so doing electricity rates will be higher?
- If necessary, should we incur some short term rate increases in order to minimize (within environmental, financial, and reliability guidelines) the long term cost of electricity?
- Should we add nuclear generation if it becomes an economic choice?

These are just a few of many questions that the utility must continue to face. We would like your comments.

Nova Scotia Power
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Halifax, Nova Scotia
B3J 2W5

Nova Scotia Power has initiated environmental programs in the following areas:

- **environmental assessment:** a full environmental assessment process was developed within Nova Scotia and implemented in 1986, and has since been used on all major projects to minimize environmental impacts.
- **design and construction practices:** in the early stages of a project's development, potential environmental impacts are identified and the measures taken to minimize any adverse impacts. During construction, environmental inspections are conducted at the site until the work is completed.
- **air quality monitoring:** air quality is monitored in the region surrounding a thermal generating station to ensure that design objectives are being met.
- **PCB management:** with the completion of destruction of concentrated PCB material in 1988/89, Nova Scotia Power became the leader among Canadian utilities in being essentially askarel (PCB) free. In 1990, a program of decontamination of large volume (over 450 litres) transformers which had low level PCB contamination was completed two years ahead of schedule.
- **fish management:** since hydro plants can create barriers for migratory fish and can affect the normal movement of resident fish, Nova Scotia Power has been working with federal and provincial fisheries officials to improve the passage of fish around these plants.
- **osprey nest management:** occasionally ospreys (fish hawks) will nest atop high transmission line structures. Every year a few of these nests, because of their shape or size, raise concerns about potential outages, fires, damage to insulators, and the danger to the birds themselves. Two joint studies with the Nova Scotia Department of Lands and Forests have helped Nova Scotia Power develop acceptable methods for nest trimming and relocation, and have allowed nests to be moved successfully and with no disruption to the osprey population.
- **vegetation control:** In 1977, reliance on herbicides was about 80 to 90%, with only green belts, road crossings and areas adjacent to water/populations cut by hand. Today clearing is achieved with a balanced use of manual and machine cutting combined with herbicide application.
- **community impacts:** Nova Scotia Power strives to minimize potential impacts to communities through the wise choice of locations for its facilities and by designing systems which lessen such impacts.

For more information on these and other efforts, write for the booklet "Nova Scotia Power—Environmental Practices."

NOVA SCOTIA POWER CORPORATION OBJECTIVES

COMMUNICATIONS

To be an open and proactive communicator.

CUSTOMER SERVICE

To satisfy our customers with responsive and reliable service in an effective and courteous manner.

ENVIRONMENTAL

To conduct our business in a manner which is respectful and protective of the environment.

FINANCIAL

To maintain rate stability and adequate revenue flow so as to achieve with our customers and creditors a high level of confidence in our financial health and integrity.

HUMAN RESOURCES

To have the right number of people, with the required skills, at the right places, when needed, doing meaningful and necessary work, safely, at a high level of productivity and motivation.

INTERNAL SERVICES

To provide responsive, consistent and cost effective service of high value in support of all Corporate operations.

OCCUPATIONAL HEALTH AND SAFETY

To not knowingly expose ourselves, contractors or members of the general public to unacceptable safety or health risks in the execution of our business activities.

TECHNOLOGY R&D

To make effective use of advanced technology and innovation to produce quality results.